

By Francie Scott
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Behind the headlines surrounding the birth and surgical separation of Angela and Amy Lakeberg is a story of innovative respiratory care.

The saga began at Loyola Medical Center, Maywood, IL, on June 29, where RCPs ventilated the Siamese twins with two Servo 900 Cs which were synchronized to deliver identical breaths to two tiny sets of lungs. The girls shared a thoracic wall, a liver, and a six-valve heart. Their lungs were compressed into the thoracic space.

case for everyone, including the therapists.”

Ms. Kaupie solved identification problems by color-coding the babies. Pink tape was used to mark the equipment belonging to one: yellow, for the other.

THE GIRLS were given a trial without mechanical ventilation immediately after their birth. They were X-rayed during this time so caregivers could assess their status and determine which organs were shared.

“The chest X-ray was hard to read,” Post said. “They were literally joined from the bellybutton to the top of the rib cage.”

Transporting the girls to the radiology department for an MRI posed yet another challenge.

RCPs tried using two bags, manipulating one with the left hand and one with the right hand, but that was cumbersome and difficult.

NEONATAL and pediatric specialist Richard Kita, RRT, came to the rescue by adapting an Ambu bag and fitting it with two outlets. That way, RCPs could synchronize the hand ventilation. The double-outlet bag was also used on the trip to Philadelphia.

Ms. Kaupie, who made the trip with the twins, said the Ambu bag adaptations included 10 lengths of large bore tubing

excruciating detail,” prior to the transfer, Post said.

Hoydu and his staff had two Servo 900s ready to take over the ventilation. “Once we got them stable they remained pretty stable,” he said.

DIAGNOSTIC work-ups continued at CHOP before doctors there decided to operate. Two teams of surgeons were assembled: one to work with the liver and one for the heart. The latter team was led by prominent cardiothoracic surgeon William Norwood, MD.

“The physicians and surgeons had to correct the abnormalities and make them as normal as possible so things like breathing and circulation are as normal

The Baby in the Bottle:

The Saga of Tiny Angela Lakeberg

Denise Kaupie, RRT, of Loyola, hand-bagged the twins using an adapted Ambu bag with two outlets on the flight from Chicago to Philadelphia, where a team of surgeons from Children’s Hospital of Philadelphia were to evaluate the girls for surgical separation. Amy died during the Aug. 20 procedure.

ANGELA LAKEBERG currently rests in a mini-iron lung developed by veteran biomedical engineer Jack Emerson, who used a spring water bottle as the shell for the negative pressure ventilator.

“To get her out of the bottle won’t be as difficult as getting her off the (positive pressure) ventilator,” said Jeffrey Hoydu, BS, RRT, director of respiratory care at Children’s Hospital (CHOP). “It is going to be a slow and steady progress. We are hoping everything goes well.”

Daniel Post, BS, RRT, and his team of neonatal therapists at Loyola prepared for the birth of the co-joined twins as well as they could, but they knew they would be trailblazers because there was scant data on the subject, and no one knew which organs the babies shared until they were born.

Jonathan Muraskus, MD, an attending physician at Loyola, did “the intellectual work” and briefed other caregivers as best he could.

However, there were only a few cases to study, and it was difficult to predict the needs of the twins.

“**THERE’S NO** science, with only three or four cases like this. The key was to be as prepared as possible. You didn’t know what was going to be involved,” said Post, assistant director of respiratory care.

The team eagerly anticipated the birth of the twins, and Post and his team were on hand when the infants were brought to the nursery on June 29.

“We were definitely involved from day to day,” Post said. “It was a unique

Angela and Amy were given supplemental oxygen and then CPAP, but they needed more aggressive ventilation. Post said it was difficult to choose what would be best for them,

“There were two sets of lungs compressed into this unusual-shaped thorax,” he said. “They shared a thorax, but it was unclear whether they shared a circulatory pathway.”

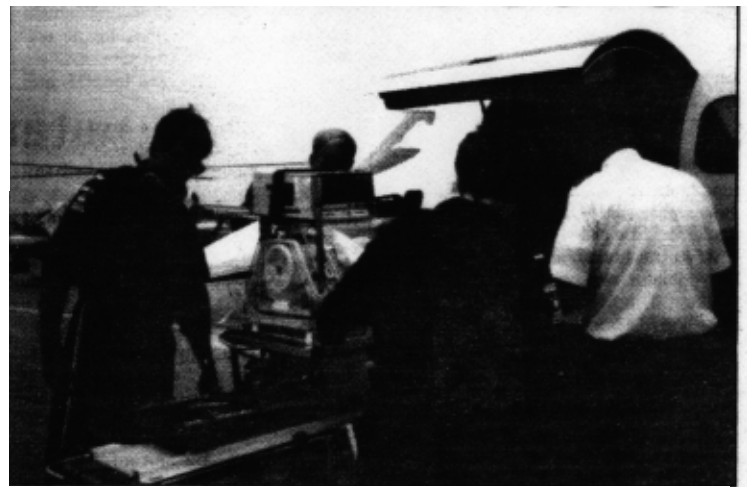
PHYSICIANS and RCPs at Loyola decided to synchronize ventilation for the girls with two Servo 900 Cs. The Loyola team had previous experience with independent lung ventilation, and the babies did well on the Servos.

“We didn’t have anything to lose,” Post said, “It made sense, because if they shared the same circulation and if you



applied the pressure at the same time, there would be less chance of ventilation perfusion mismatch.”

Post said it “was more or less like ventilating two patients side by side, since they did have two sets of lungs.” However, he conceded, “By sharing the same thoracic cavity, it did challenge us a bit.”



The Lakeberg twins are transferred to a helicopter at Philadelphia airport for the last leg of their journey to Children’s Hospital of Philadelphia. (photo/courtesy Denise Kaupie)

connected to a “Y” adapter and two endotracheal tube adapters.

“I could use one Ambu bag and each breath was synchronized. This was a really good design from Rich,” she said.

The long tubing was a bonus during the trip because the isolette was difficult to maneuver in the helicopters and Lear jet.

“**MOVING** the isolette into the helicopter took a lot of people,” Ms. Kaupie said. “With the extra length of tubing, I was able to stand back until they got the isolette into the helicopter.”

The flight from Chicago to Philadelphia was uneventful, according to Ms. Kaupie. They did have to turn the temperature down in the isolette.

“They generated a little bit more body heat than one baby typically would,” she said.

Dr. Muraskus and a nurse clinician also accompanied the twins on the flight, and all three members of the transport team met with clinicians at CHOP to discuss the care of the twins. CHOP had been chosen for the surgery because physicians there had previous experience separating cojoined twins.

“The attendings talked to each other in

as possible,” Hoydu said.

CHOP RCPs have been working with Angela since the surgery. They began with volume ventilation. “We got her down to an IMV of 10, then we extubated her and put her on the negative-pressure ventilator,” Hoydu said.

Angela has a Large six-valve heart, and Hoydu noted, “The whole structure of the chest does not lend well to the natural mechanics of breathing. The heart is bigger than that of a normal child and leads to restriction on the chest.”

HER WEANING has been slow and gentle, as the team seeks to strengthen her respiratory muscles. Linda Napoli, BS, RRT, described the weaning process for television reporters in Philadelphia.

Angela is holding her own; her status was recently upgraded from “critical” to “serious.”

The death of tiny Amy Lakeberg has brought a tinge of sadness to an otherwise remarkable story.

“I’m glad it (the surgery) was done at another hospital,” Ms. Kaupie said. “A lot of the staff just fell in love with the girls. It would have been hard to take them to the OR knowing that only one was going to come back.”